

## CLAIMS

1 1. In a remote data mirroring arrangement of data  
2 storage systems, a method of connecting ports on a data  
3 storage system to ports on other data storage systems  
4 comprising:  
5 providing each storage system with configuration  
6 topology information;  
7 determining from a switch fabric that connects to  
8 ports of all of the data storage systems information  
9 identifying ports of the other data storage systems connected  
10 to the switch fabric; and  
11 using the configuration topology information and the  
12 information obtained from the switch fabric to establish a  
13 logical link between a port on the storage system and a second  
14 port on a second storage system so that data residing on a  
15 device group supported by the port and a corresponding,  
16 mirrored device group supported by the second port can be  
17 exchanged between the data storage system and the second data  
18 storage system.

1 2. The method of claim 1, wherein the configuration  
2 topology information comprises configuration topology tables.

1 3. The method of claim 2, wherein the configuration  
2 topology tables further comprise a device groups table  
3 identifying the device groups supported by the data storage  
4 system and providing for each of the device groups a pointer  
5 to one of the other data storage systems that serves the  
6 device group.

1 4. The method of claim 3, wherein the configuration  
2 topology tables further comprise a remote systems table  
3 specifying by serial number each one of the other data storage  
4 systems that is pointed to by the pointer in the device groups  
5 table.

1 5. The method of claim 4, wherein the configuration  
2 topology tables further comprise a processors table  
3 identifying by a unique name each processor in the data  
4 storage system and providing an associated pointer to any one  
5 or more of the device groups supported by such processor.

1 6. The method of claim 5, wherein determining  
2 comprises:  
3 receiving from the switch fabric a list of the ports  
4 of the other data storage systems, the list including for each  
5 of the ports a corresponding World Wide Name, the World Wide  
6 Name including unique names for processors and a serial number  
7 for the data storage system with which the port is associated.

1 7. The method of claim 6, wherein using comprises:  
1 determining if any of the device groups are served  
2 by the World Wide Name.

1 8. The method of claim 7, wherein using further  
2 comprises:  
3 determining if a serial number of one of the storage  
4 systems pointed to by any of the device groups matches the  
5 serial number included in the World Wide Name;

6           if a match exists, reading the unique processor name  
7 that is associated with the pointer that points to the matched  
8 device group; and  
9           writing to a new link entry in a link table pointers  
10 to the unique processor name and the device group as well as a  
11 state value of one.

1   9.       The method of claim 8, wherein using further  
2 comprises:  
3           performing a single link discovery for the port and  
4 the port having the World Wide Name.

1   10.      The method of claim 9, wherein the ports are state  
2 machines and wherein the single link discovery establishes the  
3 logical link when each of the state machines advances to a  
4 '0xFF' state from a '1' state.

1   11.      The method of claim 10, wherein performing the  
2 single link discovery comprises exchanging between the ports  
3 data from the respective configuration topology tables of the  
4 ports to determine if the data matches.

1   12.      The method of claim 1, wherein the switch fabric  
2 comprises a Fibre Channel switch fabric.

1   13.      A system comprising:  
2           an arrangement of storage systems each adapted to  
3 control at least one group of devices that are supported in a  
4 mirrored configuration with a corresponding group of devices  
5 controlled by one of the other storage systems;

6           for each device group and corresponding device  
7 group, first ports associated with the device group and second  
8 ports associated with the corresponding device group; and  
9           a switch element adapted to connect one of the first  
10 ports to at least one of the second ports so that data may be  
11 exchanged between the first and second ports for each device  
12 group and corresponding device group.

1   14.       In a remote, mirrored arrangement of data storage  
2 systems, a data storage system comprising:  
3           a port adapted to control at least one device group;  
4           a switch element coupled to the port and ports in  
5 the other storage systems; and  
6           wherein the port uses the switch element to link the  
7 port to a selected one of the ports controlling a second  
8 device group that mirrors the device group controlled by the  
9 port.